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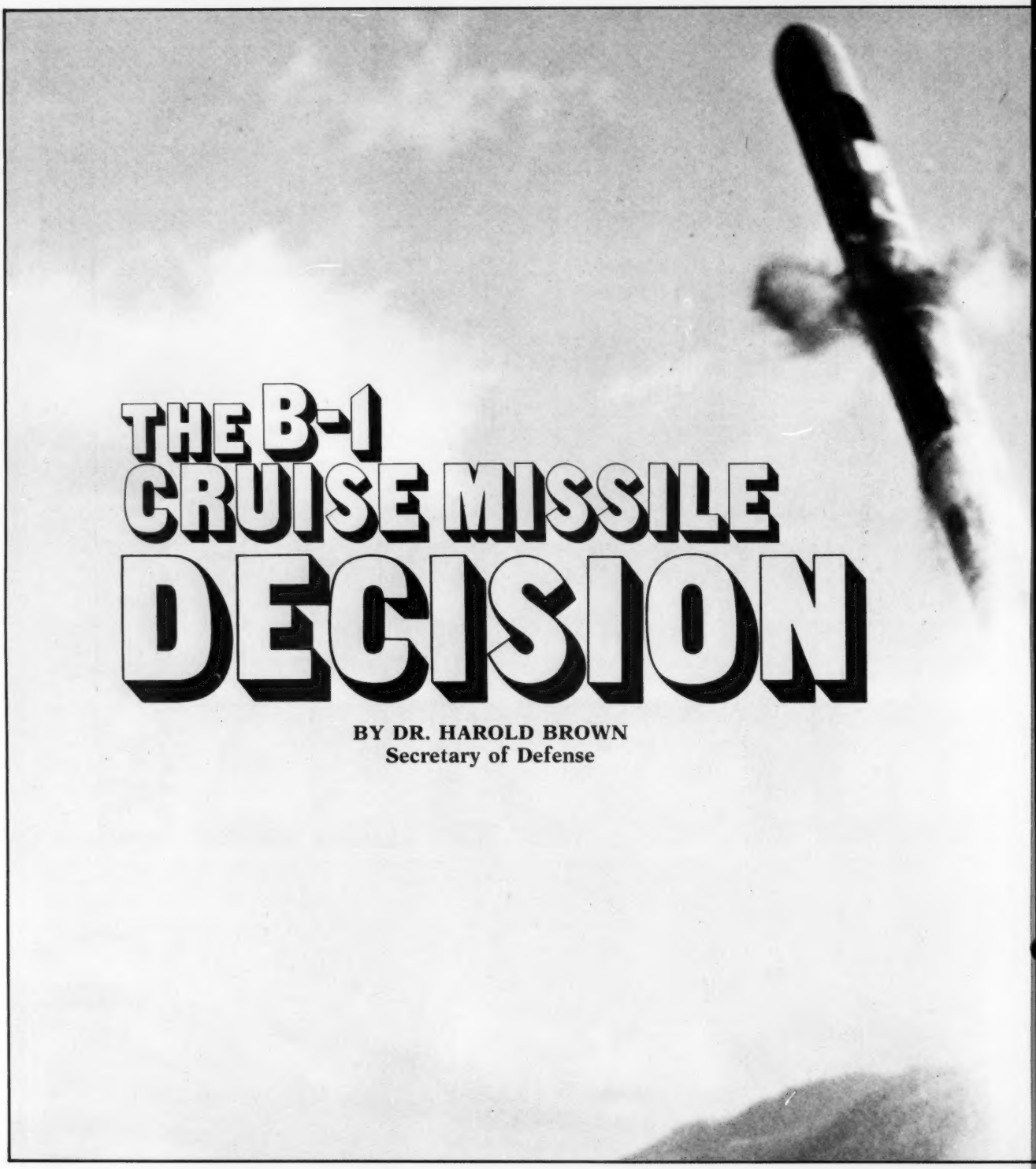
COMMANDERSDIGEST

# WHAT'S BEHIND THE B-1 CRUISE MISSILE DECISION?



# THE B-1 CRUISE MISSILE DECISION

**BY DR. HAROLD BROWN**
**Secretary of Defense**

President Jimmy Carter's decision on June 30 to cancel production of the B-1 bomber and to develop and produce, instead, long range cruise missiles for the B-52 and perhaps for other air-launch vehicles requires an adjustment to the fiscal year (FY) 1978 defense budget. The B-1 funds have been deleted from the FY 78 budget and the President has submitted an amendment that provides for the additions associated with the B-52/cruise missile program. I would like to review the basis for the decision on the B-1 and cruise missiles, and describe the major items in the budget amendment.

**STRATEGIC CAPABILITIES**

Our primary measure of strategic capability is the ability to retaliate after a Soviet first strike on U.S. forces. Our analyses show that, over a range of wartime events, U.S. current forces could ride out such a massive Soviet first-strike and retaliate with devastating effect. Excluding new systems (cruise missiles, B-1, M-X), we would have the above capability even after a Soviet first strike, and taking into account their projected active defenses. In terms of wartime capability, this situation is acceptable for the national security. However, there are other issues that we must consider: the need to hedge against the unexpected, and the impact of comparative capabilities with the Soviet Union on international perceptions (Soviet, third party, and our own).

**HEDGING**

We already rely heavily on our submarine-launched ballistic missile (SLBM) force. If we do not improve our bomber or intercontinental ballistic missile (ICBM) forces, particularly as our ICBM silos become increasingly vulnerable to the growing number and accuracy of the Soviet ICBM force, that relative reliance will continue to grow, with SLBMs providing perhaps five out of every six penetrating weapons by 1986. We must, therefore, pay attention to the ways in which our SLBMs might be defeated. One possibility is an anti-submarine warfare (ASW) breakthrough; another is a more effective anti-ballistic missile (ABM) development followed by clandestine or rapid deployment.

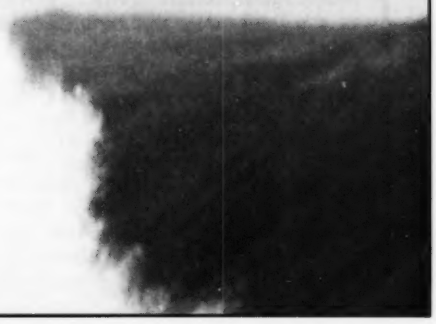
The possibility that such unexpected evolutions could happen in a very short time, in terms of development and massive deployment, is small. However, we cannot exclude it absolutely, and the consequences would be so serious that we cannot ignore it.

In order to hedge against unexpected breakthroughs in defensive technology, we maintain three separate strategic forces:

- SLBMs,
- ICBMs, and
- Air-breathing systems.

Together they make up the Triad.

It seems clear that the best hedge against potential ASW threats lies in the air-breathing leg of the Triad. Additional emphasis on SLBMs is clearly no way to hedge against threats to the SLBM force. Additional ICBMs would do better, but if in fixed silos, would suffer the same increase in prelaunch vulnerability we already expect for Minuteman. Mobile ICBMs, such as the M-X, can hedge against an ASW development but not against a breakthrough (or breakout) in ABM



# DEFENSE NEWS BRIEFS

## AF Assigns First Women Pilots

Air Force is assigning seven of the 10 women pilots it will graduate in September to first-line, noncombat aircraft—two to KC-135 tankers, two to C-141 Starlifters, two to C-9 aeromedical evacuation aircraft, and one to a WC-130 hurricane hunter. The other three pilots have been selected as instructor pilots—one on the supersonic T-38, one with the T-37 jet trainer, and one with the T-43 primary prop trainer.

## DoD Notifies Congress of Proposed Sales

DoD notified Congress Aug. 1 of proposed sales of F-5 fighter aircraft to Korea and Pershing missile parts to Germany.

The letter of offer to the Republic of Korea is for the purchase of 14 F-5F aircraft and spare parts estimated at $69.2 million.

The letter of offer to the Federal Republic of Germany is for 16 warhead sections, 17 first and second stage sections, and 16 flight instrument sets of the Pershing missile estimated at $26.4 million.

## Energy Gets Forrestal Building

The Forrestal building in Washington, occupied mainly by the Department of Defense, is being turned over to the newly-created Department of Energy.

General Services Administration (GSA) said the move will be made as expeditiously as possible, with the seventh floor being made available by Oct. 1 as the executive suite for the new Secretary of Energy, Dr. James Schlesinger.

### Armed Forces Strength

| | June 30, 1977 preliminary | May 31, 1977 | June 30, 1976 |
|---|---|---|---|
| **Total DoD** | 2,074,810 | 2,070,085 | 2,081,909 |
| Army | 779,265 | 777,537 | 779,417 |
| Navy | 524,875 | 525,194 | 524,678 |
| Marine Corps | 189,714 | 187,445 | 192,399 |
| Air Force | 580,956 | 579,909 | 585,415 |

## Traditional White Hat, Bell-Bottoms Coming Back For Sailors

Sailors in the first four pay grades (E-1 to E-4) will soon be wearing the traditional bell-bottom uniform with the white hat.

Chief of Naval Operations Admiral James L. Holloway III announced Aug. 1 that the Navy will issue bell-bottoms to 20,000 fleet personnel during 1978 on a one-year test basis.

Fleet Commanders will select the specific units to participate in the test.

The new bell-bottom uniform is expected to be available in commercial stores during the spring of 1978. Navy already has authorized other non-test sailors to purchase and wear the new uniform.

Petty officers in pay grades E-5 and E-6 will continue to wear the dress blue double breasted uniform, and chief petty officers (E-7 to E-9) will continue to wear the distinctive "chief's uniform."

The reason for the test is to try out blue serge material as a replacement for the old blue melton material of bygone bell-bottoms.

capability—although the much bigger payload of the M-X would provide the capability of saturating most conceivable ABM defenses. Thus, either bombers or air-based cruise missiles would be the first hedge of choice against possible threats to our essential SLBM force, with mobile ICBMs an important second.

**Table 1**

**Static Measures of Strategic Balance [1]**
**(U.S. as % Soviet)**

| | *1977* | *1986* |
|---|---|---|
| Warheads | 240% | 104% |
| Megatons | 35% | 26% |
| Throw Weight | 75% | 48% |
| Hard Target Kill Potential | 160% | 28% |

[1] *Excluding Cruise Missiles, B-1, M-X.*

**COMPARATIVE CAPABILITY**

The second issue concerns how our strategic capability compares with Soviet capability, and the effects of this comparison on perceptions. There is no generally accepted way to make this comparison. However, the two methods used most often are:

- comparing static indices and
- comparing capabilities after a first strike by one side or the other.

**Table 1** gives the primary static measures of the strategic balance with the figures for the United States given as a percentage of the Soviet figures and excluding cruise missiles, B-1, and M-X. The table shows that the United States has a wide lead in numbers of warheads now and is projected to stay ahead through 1986—although the margin will decrease significantly with the Soviet deployment of multiple independently targetable reentry vehicles (MIRVs). In terms of both megatons and throw weight, the Soviets are ahead now and are projected to stay ahead. For hard target kill potential, we have a significant lead now, but with the projected deployment of large numbers of accurate MIRVs, the Soviets will have a decided edge in 1986.

The second comparison concerns how our remaining strategic forces would compare with the Soviets' after a first strike on the United States. At present, the balance is in our favor. But it will become less and less favorable as the Soviet missile force becomes more accurate and carries more MIRVs, resulting in a larger and larger part of their force being left over after attacking our Minuteman fields and bomber bases.

The balance, we estimate, will have evened by about 1979 for the case where we are caught by the Soviet attack in a state of day-to-day alert. On the other hand, if we could count on being in a state of generated alert at the time of the attack, it would be an additional two or three years before the balance evened. Another possible case would be a U.S. launch of its ICBMs during a Soviet attack—an approach we should consider only with the greatest caution. The results for this case indicate that U.S. surviving forces are increased considerably.

This projected Soviet growth would not be substantially affected by any Strategic Arms Limitation Talks (SALT) arrangement we have proposed, except for the comprehensive option. In that case, though, instead of the Soviets having a possible advantage over us after a Soviet first strike in the 1980s, we would remain essentially equal—if the proposed restrictions on ICBM testing hold the Soviet accuracy to about what it is today.

**PERCEPTIONS**

The advantage to the Soviets of a possible lead in the primary measures of comparative capability is ill-defined in terms of useful wartime capability. But it might have some political value during peacetime or in a crisis. The perception of the U.S.-Soviet strategic balance has been and will be shifting away from that of U.S. advantage and becoming more favorable to the Soviets. Such perceptions can have an important effect. We must be sure that perceptions are such that no doubt as to our capability or our will exists in the minds of the Soviet leaders, or in the minds of our allies, or even in our own minds should we be faced with a moment of deep crisis.

In the absence of constraints on Soviet capability for the mid-1980s on the order of the U.S. comprehensive SALT proposal (assuming that would freeze Soviet ICBM accuracy), I believe we need to respond to the Soviet buildup with an increased second-strike capability. The issue is, what should we plan to add to our forces now and what options should we retain or develop for possible further additions later.

**ALTERNATIVE RESPONSES**

One best response to the growing imbalance in comparative forces after a Soviet first strike lies in the air-breathing leg of the Triad. As to the alternative of increasing the SLBM leg of the Triad, there is no way, given submarine building lead times, to add significantly to the force by the early 1980s. But even if possible, it would not be prudent to make that the only response. I noted earlier our heavy dependence on this force. As secure and invulnerable as we believe this system to be, we should not rest that much of our deterrent capability on any single system.

As to the alternative of increasing the ICBM leg of the Triad, the situation is more complex. One possibility, which I will be reviewing carefully in preparing the budget for FY 1979, is the M-X mobile ICBM. Analysis to date indicates M-X would be comparable to the Trident in terms of cost and effectiveness. There are some drawbacks inherent in M-X mobile deployment. Finding a suitable area large enough to serve as a base is one; the difficulty of verifying numbers of mobile missiles and, thus, the complexity they would add to our SALT negotiations is another. M-X has a high accuracy and kill probability against Soviet fixed systems—a threat that Soviet ICBMs will pose for us as we reach the early 1980s. Moreover, it probably can be arranged to have high assurance of good command and control. In any event, we could not introduce the M-X as a mobile missile before about 1985. Therefore, it would be of no use in redressing the imbalance in comparative capability after a Soviet first strike in the early 1980s, though it could contribute importantly to that goal in the mid-1980s.

Another possibility would be to produce more Minuteman IIIs, to be retrofitted into Minuteman II silos. In terms of our present plans, such a course of action would quickly run into the 1,320 (or lower) limit on MIRV launchers. This course would give us some increased capability in the near-term, but the advantage would be transient at best in the face of the growing number and accuracy of Soviet MIRVs.

Before leaving the subject of land-based ballistic missiles, I would like to turn to another matter of perceptions—how the Soviets might perceive the threat to them of a U.S. preemptive strike. They may calculate that a U.S. first strike would result in a ratio adverse to them, just as we calculate that a Soviet first strike would result in a ratio adverse to us. To the extent that this is so, either side will, during the next decade, have a so-called "advantage" in firing first. I do not consider this a tempting advantage, nor do I think this situation, per se, would lead to preemption; the consequences of such an exchange, whichever side goes first, would in my judgment be catastrophic for both sides because of the forces on each side

## WHAT THEY ARE SAYING . . .

***"With the end of the draft, the Guard and Reserve are the primary option available to the President for quickly deploying additional military forces in a national emergency. Planning, particularly with regard to conventional conflict in Europe, depends heavily on the mobilization potential of reserve forces. Our conventional forces in Europe need early Guard and Reserve reinforcement by combat and combat support units to provide them with a war-sustaining capability. These reinforcing elements must be capable of rapid deployment in the event of hostilities since the warning time for future conflict is likely to be short. Thus, to be useful, the Guard and Reserve must have high standards of readiness. The administration—indeed the President himself, is committed to insuring that the Nation gets an adequate return on its investment in our Guard and Reserve forces."***

**—RAYMOND S. WEBSTER,** *Acting Deputy Assistant Secretary of Defense (Reserve Affairs), before the graduating Class 77-2 at the Army Logistics Management Center, Ft. Lee, Va., Aug. 5, 1977.*

that would survive preemption and strike back. But a so-called "advantage" in striking first is a trend in the wrong direction, and we should not aggravate it unnecessarily.

Our estimate of the surviving Soviet forces after a U.S. first strike indicates that excluding cruise missiles, B-1 and M-X, our residual forces would in that case exceed the Soviets' surviving forces for the next few years, but the difference would become insignificant by the mid-1980s. Adding the cruise missile makes no difference in this picture. However, if the United States deployed M-X, the Soviet surviving forces after a U.S. first strike would be reduced significantly in the late 1980s if they failed to alter their forces in the direction of putting a larger fraction into SLBMs or mobile ICBMs.

Thus, adding mobile M-Xs, because of their short flight time and expected high accuracy, could add to the Soviet concern about the late 1980s more than

**This mockup of the MX (above) depicts its three parts—first-stage motor, second-stage motor with extending nozzle, and third-stage motor containing the post-boost vehicle and protective shroud. An artist's conception, (right) shows dual MX missile launchings.**

***"The DoD is vitally interested in any legislation affecting Federal Government procurement, because it obligates about 75 per cent of the Federal procurement dollars. DoD procurement obligations in Fiscal Year 1976 totaled $46.9 billion (involving over 10 million procurement actions), with $42 billion involving appropriated funds for the military, and the remainder relating to foreign customers' orders. Approximately 60 per cent of these obligations are for major hard goods, that is, weapon systems and related equipment. The other 40 per cent pertains to construction, services, and other support such as subsistence, clothing and fuels."***

**—DR. WILLIAM J. PERRY,** *Director, Defense Research and Engineering, before the Subcommittee On Federal Spending Practices and Open Business, Committee on Governmental Affairs, July 22, 1977.*

***"We must, in my judgment, retain rough equivalence—balancing asymmetries and actively pursuing SALT progress. I want to emphasize that the Air Force supports SALT enthusiastically. I would be personnally dismayed by any lapse in the diplomatic achievements and initiatives which have constrained the dimensions of international nuclear military power. Because I work day after day in the immediate presence of that power, I support SALT with a special enthusiasm—and simultaneously support realistic, assured deterrence with a special concern."***

**—GEN. DAVID C. JONES,** *Chief of Staff, U.S. Air Force, in a speech before the Comstock Club of Sacramento, Calif., July 25, 1977.*

would our adding to the air-breathing leg of the Triad because the latter does not include first-strike weapons. Though this need not be destabilizing if both sides have major forces that cannot be destroyed in a first strike, it argues somewhat against adding first to our ICBM force, or for that matter our SLBM force, if we can do what we need to now by adding to our air-breathing force.

There may well be a need to deploy some sort of advanced land-based missile in the mid-1980s to assure strategic equivalence over a broad range of strategies. But none of the land-based ballistic missile options mentioned above is preferable to an air-breathing alternative as a way of retaining our retaliatory capability at parity with the Soviets through the 1980s.

**AIR-BREATHING OPTIONS**

We have examined the widest range of air-breathing systems. We considered a modernized version of the FB-111—the FB-111H; a rebuilt and upgraded version of the B-52—the B-52X—to be used as a penetrating bomber; a new penetrating bomber that might be less expensive than the B-1; a standoff cruise missile carrier based on current wide-body transport designs, and carrying many more cruise missiles than would fit into the B-52; reworking the existing B-52Ds, Gs, and Hs to keep them in service beyond 25 years and equipping them with cruise missiles; and, of course, the B-1.

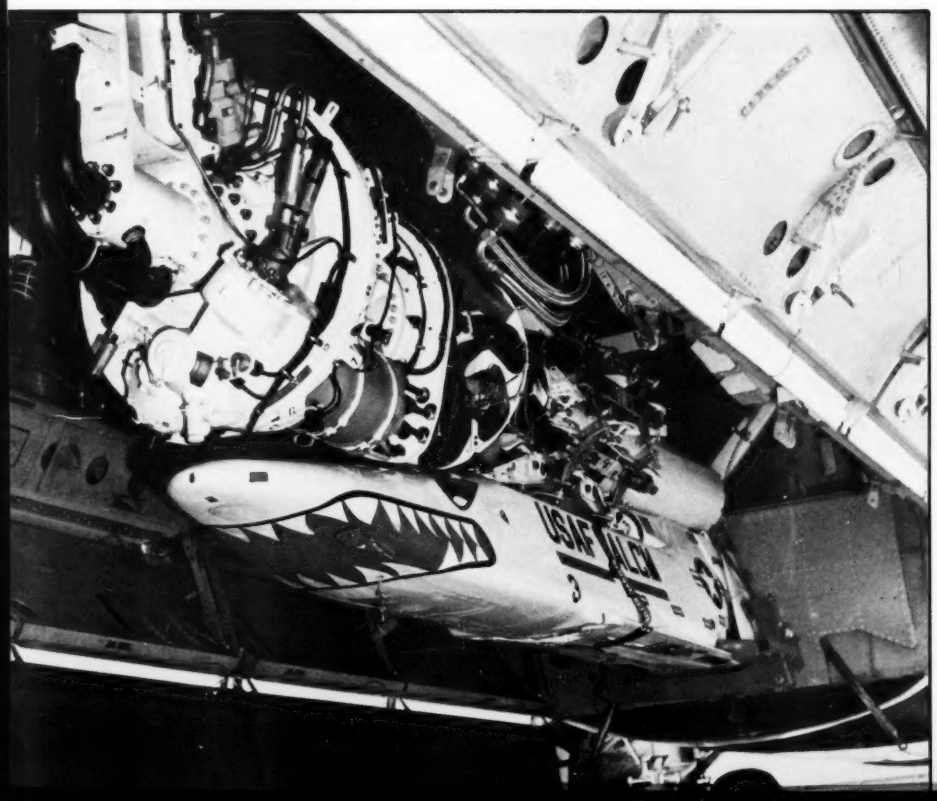
Most of these alternatives, for one reason or another, fell by the wayside in the course of our review.

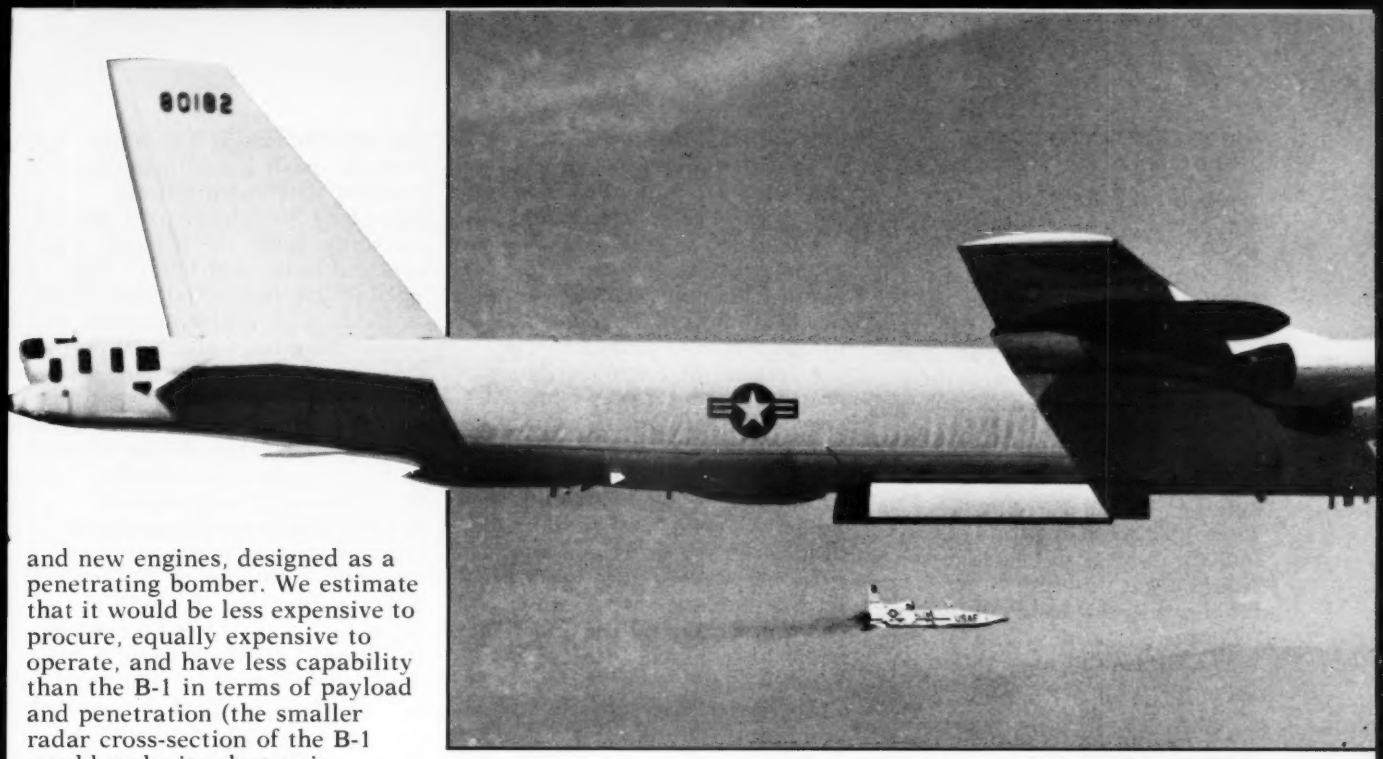
First, the alternative of developing a new penetrating bomber that would be less expensive than the B-1 proved infeasible. The development time would be long and the prospects for a significantly less expensive design proved to be poor. Though elimination of the B-1's supersonic capability might save in production costs, it would not save more than the new development costs—and thus nothing significant in net costs.

Second, we eliminated the FB-111H. Our analysis showed no significant advantage in cost or effectiveness over the B-1. That being the case, coupled with the added uncertainties of—and time required for—development, there was little purpose in pursuing an option that at best would be roughly equal to what we already have in hand. However, now that we have canceled production of the B-1, it may turn out that beginning in a few years from now it will be less expensive to maintain some version of the FB-111 as an option for an advanced penetrator than the B-1.

Third, we eliminated the B-52X—the completely rebuilt B-52 with an expanded bomb bay

**Waiting to be launched from the bomb bay of an Air Force bomber is this Air Launched Cruise Missile (AGM-86).**






**An Air Force ALCM is launched from the weapons bay of a B-52 Stratofortress. This launch was made 10,000 feet above the ground at the Army's White Sands Missile Range in New Mexico.**

and new engines, designed as a penetrating bomber. We estimate that it would be less expensive to procure, equally expensive to operate, and have less capability than the B-1 in terms of payload and penetration (the smaller radar cross-section of the B-1 would make its electronic countermeasure (ECM) more effective and reduce its attrition). In terms of relative cost and effectiveness, the B-1 and the B-52X would be about equal, although because the total number of B-52 air frames is fixed, the B-1 would have a greater potential for total increase in capability. For the B-52X, the question arises about the survivability of such a large penetrating aircraft against the defenses of the late 1980s and beyond. Moreover, the development of the B-1 is now essentially complete, whereas the B-52X has not progressed beyond the stage of studies. However, now that the B-1 is limited to development, we will continue to study the B-52X as another possible option.

A fourth possibility is the standoff cruise missile carrier based on existing wide-bodied transport designs, and carrying several dozens of cruise missiles. To do an equivalent job, the cost of this alternative is significantly lower than that of the B-1. However, the feature that results in such economies—carrying so many missiles on each aircraft, and thus requiring relatively few aircraft—also results in the possible disadvantage of "having too many eggs in one basket." The cruise missile carrier would be considerably more attractive if it were deployed along with a large number of smaller aircraft carrying cruise missiles. In this way the problem of too few carriers would be overcome, and the cruise missile carrier would provide the possibility of dramatically increasing our capability above current levels. Therefore, while I do not believe that we should rely on the cruise missile carrier alone for the air-breathing part of our retaliatory capability, the potential of the cruise missile carrier is clearly great enough to justify the funds we are asking in the budget amendment for its continued development. That leads us to the last two alternatives: the B-1 and the B-52 equipped with cruise missiles.

**B-1 VS. B-52 WITH CRUISE MISSILES**

A central issue in the comparison between the B-1 and the B-52 with cruise missiles is the nature and effectiveness of the Soviet defense in the late 1980s and 1990s. We must consider the range of alternatives open to the Soviets between now and then. There are inevitable differences of opinion about the absolute and relative effectiveness of various kinds of prospective Soviet defenses within 20 years. There is agreement that the B-1 and the B-52 with cruise missiles would elicit different Soviet reactions in the design of their air defenses.

The B-1 would have relied on three features to assure penetration:

- To suppress fixed defenses in known positions—short-range attack missiles (SRAMS). These, of course, would have been of no use against mobile defenses, which cannot be pretargeted.
- To defeat enemy radar—a radar cross-section small for a manned bomber, coupled with powerful electronic countermeasure (ECM) gear.
- To minimize exposure to ground-based defenses—high speed and excellent handling at low altitude. This would have been less effective against airborne defenses, assuming the Soviets developed the equivalent of airborne warning and control system (AWACS) and fighters with an advanced look-down, shoot-down capability, and if they could have coped with the B-1's ECM.

The B-52/cruise missile combination relies on these features:

- To avoid exposure of the parent aircraft to enemy defenses—a reasonably long range for the cruise missile—a range of 2,500 km is needed for this concept to be practical—and the longer the better.
- To defeat enemy radar—the cruise missile's extremely small radar cross-section—far smaller than the B-1's.
- To minimize exposure to ground-based defenses—penetration at extremely low altitude. The cruise missile would not penetrate quite as fast as the B-1 would have but would penetrate slightly lower. It would have to overcome the same sort of airborne defenses, should the Soviets be able to develop them. However, I believe that coping with the cruise missile's tiny radar cross-section will be far more difficult for the Soviets than coping with the B-1's ECM—perhaps even by taking advantage of it—would have been.

Given assumptions as to scenario, the task to be done, costing ground rules, etc., that I feel are the fairest and most realistic basis for comparison, coupled with assumptions regarding Soviet defenses that, if anything, favor the B-1 over the cruise missile, a B-1 force that would have had equal capability to B-52s with cruise missiles would have been about 40 per cent more expensive.

That estimate, I might note, is based on the assumption that the B-1's ECM gear would have been at least moderately effective. While we have no reason to believe that it would not have been, that is an inherently uncertain and, indeed, unknowable issue. We will not know how well the B-1's critical ECM gear will work against the Soviet defenses we expect until we complete the ECM operational testing in the fall of 1979. Even then, we will still be uncertain as to what Soviet systems it would have had to defeat—and what improved versions of the B-1's ECM would have been like—in later years. Of course this uncertainty as to future Soviet systems also influences our estimates of the cruise missile's ability to defeat enemy defenses by virtue of its small radar cross-section. But I have more confidence in our estimates of the effect that the low detectability of the cruise missile will have on Soviet radars than in the effect that the B-1's radar countermeasures would have had.

I should also mention that the figure of 40 per cent accounts only for defenses that depend on radar. While those are clearly our primary concern, both we and the Soviets have infrared (IR) homing missiles of increasing sophistication. The heat—and thus infrared radiation—generated by the B-1's four large engines would have made it relatively more vulnerable to IR missiles than the cruise missile—powered by a single miniature jet engine—will be. To

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**TABLE 2**

**Static Measures of Strategic Balance**
**(U.S. as % of Soviet)**

| | 1977 | 1986 | | |
|---|---|---|---|---|
| | | No Modernization [1] | B-52/CM | B-52/CM + Representative CM Carrier Force |
| Warheads | 240% | 104% | 126% | 187% |
| Megatons | 35% | 26% | 25% | 34% |
| SALT Throw Weight | 75% | 48% | 48% | 77% |
| Hard Target Kill Potential | 160% | 28% | 67% | 168% |

[1] Excludes cruise missile, B-1 and M-X.

the extent that this is so, the 40 per cent figure may be low.

Thus, the B-52/cruise missile combination is the better choice on grounds of certainty of effectiveness. Moreover, the B-52/cruise missile combination will stop our current trend toward too much reliance on SLBMs, raising the number of penetrating weapons delivered by the air-breathing part of our Triad to perhaps one out of three. Our air-breathing force will be based on a new type of system at the beginning of its technological life with significant potential for further development. The B-52/cruise missile force will increase our surviving forces in the 1980s in the day-to-day alert case by about 40 per cent, and cruise missile carriers provide an option for even further increases. With cruise missile carriers and our forces on generated alert, our surviving forces would substantially exceed Soviet residual forces. Moreover, as **Table 2** indicates, the cruise missile provides the potential for significantly improving our position with regard to the static measures of the strategic balance. I am certain that the cruise missile will improve the world's perceptions of the potency of our forces, not only by maintaining the credibility of strategic force parity with the Soviet Union, but also by retaining a clear technological superiority. And finally, we are doing all this with a weapon that in no way threatens a first-strike capability.

## CONCLUSIONS

My recommendation to the President, and his decision, not to proceed with production of the B-1 were based on the conclusion that aircraft carrying modern cruise missiles will better assure the effectiveness of the bomber component of U.S. strategic forces in the 1980s. Each B-52 can launch many missiles, with great accuracy, at different targets in the Soviet Union, from a distance of many hundreds of miles. Each produces many small targets for Soviet air defenses to contend with. If additional warhead-carrying capacity is needed, that can come from new cruise missile carriers in addition to the B-52.

Moreover, the B-52/cruise missile program results in significant savings—roughly $10 billion in FY 1978 dollars over the next six years, even in comparison with a reduced program of only 150 B-1s. The first cruise missiles can be ready for the B-52s by early 1980, and the force buildup will occur at roughly the same rate and over the same period as had been planned for the B-1 deployment. Some modernized B-52s will continue in the penetrating bomber role.

With regard to the implications for SALT of this decision, the cruise missile remains a subject for negotiation. Since we are orienting our strategic nuclear capability more in the direction of cruise missiles, we have to continue to assure that our position on cruise missiles in SALT does not interfere with incorporation of cruise missiles into the strategic bomber force.

## FY 78 BUDGET AMENDMENT

All funds for B-1 production, spares, and associated military construction ($1,438 million) and procurement funds for the SRAM-B missile for the B-1 ($35 million), have been deleted from the FY 1978 budget. The B-1 research and development program will be completed to provide the option to add the B-1 to our forces if totally unexpected events should occur. The budget amendment adds $449 million to accelerate the cruise missile

**A Navy cruise missile inert test vehicle emerges from the sea after a torpedo tube ejection from an underwater test rig.**

development and for new initiatives in the strategic bomber and early warning programs. Seventy per cent, or $312 million, of the funds is for the acceleration of both the Tomahawk and the ALCM cruise missiles, development of B-52 launchers and pylons, and research and development on the cruise missile carrier that could have an initial operational capability (IOC) in FY 1981. I believe it prudent to maintain both air-launched cruise missile programs at least through FY 1978, and quite possibly beyond. The cruise missile program now has high national priority and we need to be certain of its success. However, we intend to develop only the long-range versions of the air-launched cruise missiles. The short-range versions, intended for the B-1, are no longer necessary, and they do not provide enough standoff capability for either the B-52 or the cruise missile carrier.

In addition, $99 million is included for research on cruise missile carrier concepts and improvements for the B-52, including advanced avionics, electronic warfare systems, electro-optical and infrared countermeasures, and an advanced air-to-air defense missile. The amendment also includes $15 million for advanced cruise missile development and $3 million to accelerate mapping for cruise missile guidance. Finally, $20 million is included for improvements in our warning and attack assessment systems.

This program will continue the Triad concept that guards against unexpected technological or strategic changes. It is based upon some pessimistic assumptions and it includes systems with inherently dissimilar vulnerabilities to destruction, both before launch and in penetration of Soviet defenses. While we cannot know for sure what the perceptions of others will be, it should give us confidence that we are not falling behind the Soviet Union. It builds on our comparative advantage in technology over the Soviet Union. It will replace some of the traditional manned penetrators with vastly greater numbers of unmanned penetrators, which are extremely difficult (even more difficult than manned bombers) to intercept, and have great potential for technological growth. It will not threaten destabilization of the balance. And it will save billions of dollars.

## WHO'S NEWS IN DEFENSE

VAdm. Moorer

Maj. Gen. Pixley

### Reassignments

**VAdm. Joseph Moorer,** Deputy Chief of Naval Operations (Plans, Policy and Operations) and senior Navy member of the Military Staff Committee of the United Nations, has been named Commander-in-Chief, U.S. Naval Forces, Europe.

**Maj. Gen. Charles C. Pixley,** Superintendent, U.S. Army Academy of Health Sciences at Ft. Sam Houston, Texas, has been named by the Army to become The Surgeon General, U.S. Army, and will be promoted to lieutenant general.

**Maj. Gen. George C. Cantlay,** USA, Deputy U.S. Representative of the North Atlantic Treaty Organization Military Committee, moves to the position of Deputy Chairman, North Atlantic Treaty Organization Military Committee, and has been nominated for promotion to lieutenant general.

**RAdm. Carl Thor Hanson,** Commander, Cruiser Destroyer Group Eight, U.S. Sixth Fleet, has been selected the Military Assistant to the Secretary of Defense.

**RAdm. M. Staser Holcomb,** The Military Assistant to the Secretary of Defense, transfers to Commander, Carrier Group One, U.S. Pacific Fleet.

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